

2016

Suicide and Culture: Exploring Country-Level Relations between Suicide Rates and Dimensions of Cultural Variability

Miriam J. Schwarzenenthal
miriam.schwarzenenthal@gmail.com

Taciano L. Milfont
Victoria University of Wellington, Taciano.Milfont@vuw.ac.nz

Follow this and additional works at: https://scholarworks.gvsu.edu/iaccp_papers



Part of the [Psychology Commons](#)

ScholarWorks Citation

Schwarzenenthal, M. J. & Milfont, T. L. (2016). Suicide and culture: Exploring country-level relations between suicide rates and dimensions of cultural variability. In C. Roland-Lévy, P. Denoux, B. Voyer, P. Boski, & W. K. Gabrenya Jr. (Eds.), *Unity, diversity and culture. Proceedings from the 22nd Congress of the International Association for Cross-Cultural Psychology*.

This Article is brought to you for free and open access by the IACCP at ScholarWorks@GVSU. It has been accepted for inclusion in Papers from the International Association for Cross-Cultural Psychology Conferences by an authorized administrator of ScholarWorks@GVSU. For more information, please contact scholarworks@gvsu.edu.

Suicide and Culture: Exploring Country-Level Relations between Suicide Rates and Dimensions of Cultural Variability

Miriam J. Schwarzenthal

(miriam.schwarzenthal@gmail.com)

Taciano L. Milfont

Victoria University of Wellington, New Zealand

(Taciano.Milfont@vuw.ac.nz)

Abstract

Suicide rates vary considerably between nations. This observation suggests that sociocultural characteristics of nations might play an important role in explaining suicidal behavior. In this study we examined country-level associations between suicide rates and dimensions of cultural variability while adjusting for gross domestic product per capita. While some characteristics of modern culture such as intellectual autonomy and secular-rational values were associated with higher suicide rates, characteristics of postmodern societies such as self-expression values and egalitarian commitment were associated with lower suicide rates. Exploratory analyses also showed meaningful associations between suicide rates and other measures of cultural variability such as societal cynicism and long-term orientation. Gender differences were also observed, with hierarchy being positively associated to female but not male suicide rates.

Introduction

Over 800,000 people die from suicide every year, making it the second leading cause of death among people aged 15-29 years (World Health Organization, 2014). While many theories and a wide array of empirical research focus on individual-level explanations of suicidal behavior, few studies have examined broader suicide patterns (for exceptions see Eckersley & Dear, 2002; Lenzi, Colucci, & Minas, 2011; Rudmin, Ferrada-Noli, & Skolbekken, 2003). Data from the World Health Organization (WHO) show that suicide rates vary considerably between nations. This finding suggests that sociocultural characteristics of nations play an important role in explaining suicidal behavior. The present study examines the extent to which suicide rates are reliably related to dimensions of cultural variability. This investigation begins with a summary of the state of research on the relationship between suicide and culture, and a brief overview of societal characteristics that might affect nation-level suicide rates.

Suicide, Modernization and Postmodernization

The French sociologist Durkheim (1897) was one of the first to propose that suicidal behavior can be explained by social factors as well as individual factors. He argued that certain characteristics of modern societies might lead to higher suicide rates. In modern societies individuals are less integrated within the church, family and the state. Due to this social disintegration and the corresponding individualism, they might easily lack a

sense of purpose in life, eventually resulting in “egoistic suicide”. Moreover, Durkheim argued that societies usually intend a certain social position for a particular person depending on his/her social status, thus regulating social needs. However, if this societal hierarchy is disturbed (anomia), individuals no longer have a firm understanding of their position in society and the discrepancy between perceived and real opportunity increases. This state of social deregulation and lack of social direction might eventually lead to “anomic suicide”.

Some authors have examined associations between suicide rates and measures of socioeconomic development to test Durkheim’s theory. Suicide rates show positive correlations with measures of socioeconomic development such as GNP per capita (Zhang, 1998), years of school attendance and percentage of population above the age of 60 (Lenzi *et al.*, 2011). In contrast, suicide rates are negatively correlated with indices typical of traditional societies such as population growth (Zhang, 1998), fertility and percentage of population under the age 15 (Lenzi *et al.*, 2011). However, correlations with socioeconomic variables only provide indirect evidence for Durkheim’s theory since the dimensions of cultural variability that he described (*e.g.*, individualism) were not measured directly.

Suicide and Dimensions of Cultural Variability

Cross-cultural research has identified meaningful and relevant dimensions of cultural variability (see Matsumoto & Yoo, 2006 for an overview). In examining cultural variability, many scholars have focused on cultural values (Hofstede, 2001; House *et al.*, 2004; Schwartz, 1994; Smith *et al.*, 1996), while others have focused on attitudes, values and beliefs (Inglehart & Welzel, 2005) or social axioms (Leung *et al.*, 2002). Moreover, some authors have pointed out that personality traits are differentially pronounced in different cultures and are often correlated with relevant dimensions of cultural variability (McCrae, 2004; McCrae *et al.*, 2005).

Following Durkheim’s theory, one would expect that a high degree of individualism in a society should be associated with higher suicide rates in that society. Furthermore, some of the theories mentioned above explicitly assume cultural differences in the acceptance of suicide. In describing the traditional/secular-rational dimension of their theory, Inglehart and Welzel (2005, p. 52) state that societies near the traditional pole “take a pro-life stance on abortion, euthanasia, and suicide”. Based on this view, one might expect suicide rates to be lower in traditional rather than in modern societies.

A number of cross-national studies have already examined the relationships between suicide rates and dimensions of cultural variability. Most of these previous studies have found positive correlations between suicide rates and individualism (*e.g.*, Eckersley & Dear, 2002; Lenzi *et al.*, 2011; Rudmin *et al.*, 2003), as well as with intellectual autonomy, affective autonomy and secular-rational values (Lenzi *et al.*, 2011).

When studying associations between suicide rates and cultural values, one has to

keep in mind that Durkheim's theory was developed more than a hundred years ago. Since then, there has been a new cultural shift within the most developed countries, resulting in postmodern or second modern societies (Beck, Boss, & Lau, 2003; Inglehart, 2000). In postmodern societies, survival is relatively secure and values like tolerance of diversity and priority of well-being over economic growth receive greater importance (Inglehart, 2000). Similarly, Beck *et al.* (2003) state that in second modern societies, institutions like the welfare state and the legal system guarantee personal choices, individual rights, and loss of class identity. Cultural modernization is reflected in the Inglehart traditional vs. secular-rational dimension and the Schwartz embeddedness vs. autonomy dimension, while cultural postmodernization is reflected in the Inglehart survival vs. self-expression dimension and the Schwartz hierarchy vs. egalitarianism dimension (Lenzi *et al.*, 2011).

While Durkheim's theory suggests that the first cultural shift from traditional to secular-rational values is associated with higher suicide rates, there is evidence that the second cultural shift from survival to self-expression values is associated with lower suicide rates. For example, Lenzi *et al.* (2011) reported negative associations between suicide rates and egalitarianism. Moreover, they examined a subsample of posttraditional societies and found that within these societies, suicide rates showed a strong negative association with self-expression values and also a tendency towards a negative association with individualism. This study suggests that postmodern perspectives should be considered when examining Durkheim's theory.

Besides theories concerned with modernist and postmodernist developments, psychological theories on antecedents of well-being might serve to explain cross-national variations in suicide rates. For example, self-determination theory suggests that humans have three basic needs—the need for autonomy, competence and relatedness—which have to be fulfilled in order to achieve psychological growth and well-being (Ryan & Deci, 2000). In this case, autonomy is understood as being an agent and acting willingly (Kagitcibasi, 2005). Similarly, other authors suggest that pursuing and achieving goals can enhance well-being because it makes individuals feel competent and in control of their lives (McGregor & Little, 1998). Based on these theories, one might expect that higher suicide rates would be associated with societal characteristics that inhibit autonomous decisions and the pursuit of personal goals, such as hierarchy or power distance. However, the associations with power distance have been mixed in previous studies (Lenzi *et al.*, 2011; Rudmin *et al.*, 2003).

The Present Study

The objective of the present study was to go beyond previous research in five important aspects. First, we will try to replicate the results of previous studies introducing GDP as a control variable. Measures of socioeconomic development are systematically correlated with suicide rates (Lenzi *et al.*, 2011; Zhang, 1998) as well as with cultur-

al variables (*e.g.*, Bond *et al.*, 2004; Hofstede, 2001; McCrae *et al.*, 2005; Smith *et al.*, 1996). Lester (2003) reported that control for GDP per capita eliminated the significant associations between suicide rates and measures of individualism. Contrary to most previous studies examining relationships between suicide rates and dimensions of cultural variability (*e.g.*, Eckersley & Dear, 2002; Lenzi *et al.*, 2011; Rudmin *et al.*, 2003) we will thus control for GDP per capita.

Second, and following Lenzi *et al.* (2011), we will analyze a subsample of posttraditional societies separately to examine the impact of postmodern perspectives and new cultural shifts on suicide rates.

Third, this study will extend prior research by examining other measures of cultural variability. Besides including the cultural value dimensions proposed by Hofstede (2001), Schwartz (1994) and Inglehart and Welzel (2012), we will also include the cultural values and practice dimensions found in the GLOBE (Global Leadership and Organizational Behavior Effectiveness Research) study (House *et al.*, 2004), the cultural values found by Smith *et al.* (1996), the two nation-level social axiom dimensions (Bond, 2004), the construct of tight and loose cultures (Gelfand *et al.*, 2011), and nation-level big five personality factors (McCrae *et al.*, 2005). We thus provide the first examination of the relations between suicide rates and these other well-known dimensions of cultural variability.

Finally, some of the dimensions of cultural variability (*e.g.*, gender egalitarianism values; House *et al.*, 2004) can inherently be expected to be differentially important for males and females. Previous studies have also observed differences in associations between male and female suicide rates and dimensions of cultural variability (Eckersley & Dear, 2002; Rudmin *et al.*, 2003). We will thus examine separately the relations between male and female suicide rates and dimensions of cultural variability.

Method

Measures

Publicly available datasets for suicide rates per year, GDP per capita and dimensions of cultural variability formed the basis of the analyses. Since cultures were defined differently in different studies, the procedure described by McCrae *et al.*, (2005) was followed in matching datasets, meaning that the most specific matches available were used. Sample size varied depending on the construct studied (ranging between 28 and 74 countries). The sample sizes for each of the analyses are shown in Tables 1 and 2.

Suicide rates. Suicide rates were obtained from the WHO (2012) and the most recent suicide rate available for each country was used (ranging between 1978 and 2010). Suicide rates were available for 102 countries.

Gross domestic product (GDP). A nation's GDP per capita was obtained from the World Bank (2013). For each nation, the GDP per capita corresponding to the year

when the suicide rate was assessed was selected. In some cases, the GDP per capita for that year was not available (*e.g.*, Honduras, Iran, Bosnia-Herzegovina) and the statistic from the closest year was used instead.

Cultural values. Nation-level scores on the dimensions of power distance, uncertainty avoidance, individualism, masculinity and long-term orientation were taken from Hofstede (2001). Nation-level scores on the dimensions of conservatism, affective autonomy, intellectual autonomy, hierarchy, mastery, egalitarian commitment, harmony were taken from Schwartz (1994). Nation-level scores on the dimensions of traditional vs. secular-rational and survival vs. self-expression were obtained from Inglehart and Welzel (2012). Nation-level scores on the dimensions found in the GLOBE project (*i.e.*, assertiveness, institutional collectivism, in-group collectivism, future orientation, gender egalitarianism, humane orientation, performance orientation, power distance, uncertainty avoidance) were obtained from House *et al.* (2004). The GLOBE study examined these dimensions in terms of practices (how a societal culture is) as well as values (how a societal culture should be). Both aspects were considered in the present study. Smith *et al.* (1996) measured the values of organizational employees and differentiated between the dimensions of egalitarian commitment vs. conservatism, and loyal involvement vs. utilitarian involvement. Nation-level scores on these dimensions were obtained directly from Peter Smith.

Other dimensions of cultural variability. Social axiom scores on the two nation-level dimensions of dynamic externality and societal cynicism were obtained from Bond *et al.* (2004). Nation-level scores on the tightness of a culture were taken from Gelfand *et al.* (2001). Nation-level scores on the big five personality factors of neuroticism, extraversion, openness, agreeableness and conscientiousness were obtained from McCrae *et al.* (2005).

Results

Table 1 presents the results of the partial correlation analyses controlling for GDP per capita. As can be seen, the results indicate *greater* suicide rates in nations with higher levels of the Hofstede long-term orientation, the Schwartz intellectual autonomy, the GLOBE institutional collectivism practices, humane orientation values, power distance practices, the Inglehart secular-rational values, and the Bond *et al.* societal cynicism. In contrast, the results indicate *lower* suicide rates in nations with higher levels of the Schwartz mastery and egalitarian commitment, the GLOBE institutional collectivism values, the Smith *et al.* egalitarian commitment, and the Inglehart self-expression values.

The correlations for male and female suicide rates and the dimensions of cultural variability were then statistically compared using an online calculator (Preacher, 2002). As shown in Table 1, the correlations differed significantly for Hofstede’s long-term orientation, Schwartz’ hierarchy and House *et al.*’s gender egalitarianism practices: the observed positive association between suicide rates and both long-term orientation and hi-

erarchy was only confirmed for female suicide rates while only male suicide rates were positively correlated with gender egalitarianism practices.

Table 1
Partial correlations between suicide rates and dimensions of cultural variability controlling for GDP per capita

Variable	N	Suicide Rate	Suicide Rate M	Suicide Rate F
Hofstede (2001)				
Power distance	67	.03	.02	.05
Uncertainty avoidance	67	.21	.27	.00
Individualism	67	.09	.15	-.05
Masculinity	67	-.04	-.04	-.02
Long-term orientation	32	.43*	.22	.75**
Schwartz (1994)				
Conservatism	28	.13	.15	.02
Affective autonomy	28	-.03	-.05	.01
Intellectual autonomy	28	.39*	.37	.31
Hierarchy	28	.03	-.16	.46*
Mastery	28	-.38*	-.50*	-.02
Egalitarian commitment	28	-.44*	-.33	-.55*
Harmony	28	.24	.34	-.07
House et al. (2004)				
Assertiveness practices	47	.07	.09	.03
Assertiveness values	47	.13	.03	.34*
Institutional collectivism pr.	47	.37*	.31*	.46*
Institutional collectivism v.	47	-.46*	-.43*	-.43*
In-group collectivism pract.	47	.07	.02	.15
In-group collectivism values	47	-.06	.03	-.27
Future orientation practices	47	-.02	-.08	.15
Future orientation values	47	-.04	-.03	-.08
Gender egalitarianism pract.	47	.18	.31*	-.14
Gender egalitarianism val.	47	.04	.12	-.19
Humane orientation pract.	47	-.14	-.15	-.11
Humane orientation values	47	.46*	.47*	.35*
Performance orientation pr.	47	.00	-.10	.25
Performance orientation v.	47	-.16	-.10	-.29
Power distance practices	47	.37*	.38*	.28
Power distance values	47	-.04	-.03	-.03
Uncertainty avoidance pr.	47	-.12	-.18	.08
Uncertainty avoidance v.	47	-.10	-.11	-.05
Variable	N	Suicide Rate	Suicide Rate M	Suicide Rate F
Smith et al. (1996)				
Egalitarian commitment	39	-.72**	-.66**	-.66**
Loyal involvement	39	-.27	-.36*	.02
Inglehart and Welzel (2005)				
Secular-rational vs. trad.	74	.57**	.53**	.56**
Self-expression vs. survival	74	-.38*	-.36*	-.33*
Bond et al. (2004)				
Dynamic externality	35	-.27	-.31	-.12
Societal cynicism	35	.41*	.36*	.43*
Gelfand et al. (2011)				
Tightness	28	.12	-.04	.41*
McCrae et al. (2005)				
Neuroticism	39	-.04	.03	-.19
Extraversion	39	-.28	-.25	-.32
Openness	39	.04	.01	.09
Agreeableness	39	.03	.04	-.03
Conscientiousness	39	-.12	-.09	-.17

Note: Numbers in bold show were correlations with male and female suicide rates statistically differ ($p < .05$). * $p < .05$. ** $p < .01$ (two-tailed)

Following Lenzi *et al.* (2011) a subsample of posttraditional societies was then analyzed separately, selecting those thirty-nine nations with a score higher than 0 in the traditional vs. secular-rational dimension. Examples of these nations include Japan, Sweden, Germany, France, New Zealand and Albania (for the complete list of the selected nations, see Lenzi *et al.*, 2011, Note 3). The results of these analyses are presented in Table 2. The correlation with the Hofstede individualism scale was now negative as expected, but still non-significant. All other correlations are similar to those reported in

Table 1. Among posttraditional societies, *greater* suicide rates are observed in those nations with higher levels of the Schwartz intellectual autonomy scale and the GLOBE humane orientation values and power distance practices scale, while lower suicide rates are observed in those nations with higher levels of the GLOBE institutional collectivism values and the Inglehart self-expression values scales.

When analyzing the subsample of posttraditional societies (Table 2), the gender differences in the correlations with long-term orientation and hierarchy were similar to those observed for all sampled societies (Table 1). Additionally, female suicide rates were strongly negatively correlated with the GLOBE gender egalitarianism values in posttraditional societies while male suicide rates were not.

Discussion

Sociocultural characteristics may explain why suicide rates vary considerably between nations. In this study we examined whether systematic associations between suicide rates and dimensions of cultural variability could be identified. We reported partial correlations controlling for GDP per capita, and also examined a subsample of posttraditional societies and separate correlations for male and female suicide rates.

The findings suggest that some characteristics of modern culture, such as intellectual autonomy and secular-rational values, are associated with higher suicide rates even after controlling for GDP per capita. This finding is consistent with arguments made by Durkheim, who suggested that modern societal developments result in social disintegration and social deregulation and might eventually lead to higher suicide rates. While aspects of modern culture were related to higher suicide rates, aspects of postmodern societies were related to lower suicide rates. It seems that when a society places emphasis on self-expression, participation in society and politics and tolerance towards outgroups (Inglehart & Welzel, 2005) and more emphasis on achieved rather than ascribed status (Smith *et al.*, 1996), the suicide rate in that society is on average lower.

Table 2
Partial correlations between suicide rates and dimensions of cultural variability for posttraditional countries controlling for GDP per capita

Variable	N	Suicide Rate	Suicide Rate M	Suicide Rate F
Hofstede (2001)				
Power distance	32	.20	.20	.17
Uncertainty avoidance	32	.18	.25	-.04
Individualism	32	-.17	-.07	-.35
Masculinity	32	.05	.04	.05
Long-term orientation	21	.37	.13	.74**
Schwartz (1994)				
Conservatism	19	-.14	-.08	-.22
Affective autonomy	19	.21	.19	.17
Intellectual autonomy	19	.62**	.59*	.49*
Hierarchy	19	-.06	-.28	.44
Mastery	19	-.45	-.61**	.03
Egalitarian commitment	19	-.43	-.32	-.57*
Harmony	19	.30	.43	-.06
House et al. (2004) (p=practices, V=values)				
Assertiveness practices	22	-.19	-.19	-.17
Assertiveness values	22	.01	-.13	.32
Institutional collectivism p	22	.42	.33	.51*
Institutional collectivism v	22	-.45*	-.39	-.46*
In-group collectivism <u>pract.</u>	22	.22	.13	.42
In-group collectivism val.	22	.11	.25	-.23
Future orientation practices	22	.07	.00	.17
Future orientation values	22	.29	.33	.13
Gender egalitarianism <u>pract.</u>	22	.01	.19	-.37
Gender egalitarianism val.	22	-.27	-.06	-.71**
Humane orientation <u>pract.</u>	22	-.04	-.08	.06
Humane orientation values	22	.49*	.56**	.23
Performance orientation pr.	22	.03	-.11	.33
Performance orientation v.	22	-.02	.09	-.27
Power distance practices	22	.44*	.46*	.29
Power distance values	22	-.36	-.41	-.15
Uncertainty avoidance pr.	22	-.21	-.27	-.05
Uncertainty avoidance v.	22	-.08	-.13	.10
Variable	N	Suicide Rate	Suicide Rate M	Suicide Rate F
Smith et al. (1996)				
Egalitarian commitment	27	-.37	-.31	-.41*
Loyal involvement	27	-.05	-.14	.17
<u>Inglehart and Welzel (2005)</u>				
Secular-rational <u>vs.tradit.</u>	40	.31	.27	.32*
Self-expression <u>vs.survival</u>	40	-.33*	-.32*	-.28
Bond et al. (2004)				
Dynamic externality	20	.37	.32	.43
Societal cynicism	20	.42	.36	.46*
<u>Gelfand et al. (2011)</u>				
Tightness	19	.35	.15	.60**
McCrae et al. (2005)				
Neuroticism	22	.09	.22	-.22
Extraversion	22	-.18	-.16	-.20
Openness	22	-.09	-.14	.01
Agreeableness	22	-.06	.00	-.19
Conscientiousness	22	.09	.15	-.09

Note. Numbers in bold show were correlations with male and female suicide rates statistically differ ($p < .05$). * $p < .05$. * $p < .01$ (two-tailed)

However, inconsistent with most previous research (*e.g.*, Eckersley & Dear, 2002; Lenzi *et al.*, 2011; Rudmin *et al.*, 2003), the correlation between suicide rates and individualism was not significant in the present study. Lester (2003) also failed to find significant associations between suicide rates and measures of individualism after controlling for GDP. One might argue that perhaps the observed significant associations was not with individualism proper, but with wealth or other related aspect that is associated with high suicide rates in modern societies. For example, it is possible that poor people are more likely to commit suicide in wealthy societies, reflecting a state of relative deprivation (Runciman, 1966). Support for this assumption comes from a USA study showing that suicide deaths is related to interpersonal income comparisons, so that individual sui-

cide risk rises with others' income within the same country (Daly, Wilson, & Johnson, 2012).

In the subsample of posttraditional societies, the correlation with individualism was negative albeit statistically non-significant. This trend is consistent with the Lenzi *et al.* (2011) results and supports their claim that in postmodern societies a new form of individualization is appearing that constitutes a protective factor against suicide: People are no longer stuck in defined roles. Instead, there is a multiplication of life contexts and biographies and increased tolerance of anticonformist behaviors. Surprisingly, intellectual autonomy showed a strong positive correlation with suicide rates in posttraditional societies (contrary to the findings by Lenzi *et al.*, 2011). A possible explanation is that too much choice can be detrimental to well-being (Schwartz, 2004).

Overall, the reported findings support the assumption that suicide rates are related to characteristics of modern and postmodern societies. But significant gender effects were also observed. For example, hierarchy was positively associated to female but not male suicide rates. In hierarchical societies, the unequal distribution of power, roles, and resources is considered legitimate (Schwartz, 1994). Possibly, women suffer more from unequal distribution of power than men because they are the ones who usually have lower social status in a hierarchical society. Supporting this assumption, gender egalitarianism values were negatively related to female suicide rates in the subsample of posttraditional societies. Pointing in a similar direction, female suicide rates were also higher in tight cultures. Tight cultures have strong norms and a low tolerance of deviant behavior (Gelfand *et al.*, 2011), which again might restrict opportunities afforded to females compared to males.

Interesting findings were observed in the exploratory analyses with other measures of cultural variability. Suicide rates were higher in societies where the world is generally believed to produce malignant outcomes (*i.e.*, high societal cynicism). This is not surprising as societal cynicism also showed strong negative correlations with self-expression values and life satisfaction in a large-scale cross-national study (Bond *et al.*, 2004). Moreover, long-term orientation was positively related to female but not male suicide rates. Importance to the future and pragmatic values is fostered in long-term oriented societies, but these goals might not be equally achievable by male and female citizens. Hence, this gender difference might be related to the associations with hierarchy, gender egalitarianism values and tightness mentioned above. Finally, none of the nation-level personality characteristics showed associations with suicide rates. Personality traits do not depend as much on context as values (McAdams & Pals, 2006) and thus do not vary much between nations (Schmitt *et al.*, 2007). When a variable has limited variance, it is less likely that it is correlated with other variables (Tabachnick & Fidell, 2007).

Caveats and Conclusion

The results of this study support the assumption that suicide rates are associated with sociocultural characteristics. However, there might also be alternative explanations for the correlations observed here. First, suicide rates data is not necessarily comparable across countries. Suicide deaths officially registered might constitute only a small proportion of the suicides that actually took place, especially in countries with greater normative pressure against suicide. Second, and although we report partial correlations controlling for GDP per capita, there are many other unexamined variables that might be influencing the associations observed here (*e.g.*, genetics or climate; Rudmin *et al.*, 2003; Schwartz, 1994). Finally, since this was a nation-level study, the results can only be interpreted on a national level. For example, the results do not allow for the conclusion that a person who endorses intellectual autonomy is more likely to commit suicide.

An important step of future studies would be to investigate whether the associations between suicide rates and dimensions of cultural variability vary in different age groups, which could indicate developmental or cohort effects. Moreover, it might be interesting to assess whether such associations can also be found with the same dimensions of cultural variability within nations.

In conclusion, this study provides a novel investigation examining whether suicide rates across nations are related to a number of well-known dimensions of cultural variability. The findings suggest that suicide prevention programs need to consider the particular cultural context. For example, programs emphasizing self-expression and tolerance towards outgroups might be effective in reducing overall suicide rates, but in more hierarchical societies supporting and fostering gender equality might be more effective in preventing female suicide rates. While in some cultures high suicide rates might be mainly due to lack of social integration, in others they might be due to extreme hierarchy and restricted opportunities for certain social groups. It is also likely that globalization has a strong influence on the observed relationships. On the one hand, globalization might spread democratic values and promote equal rights for certain social groups. On the other hand, especially in highly developed nations, it might entail an oversupply of choices that might be detrimental to well-being. We believe the investigation of these issues and the association between suicide rates and dimensions of cultural variability are important avenues for further research.

Author note

The authors thank Fabiane Vick for discussions regarding suicide rates among indigenous communities in Brazil. These discussions lead to the research reported here. Correspondence concerning this article should be addressed to Taciano L. Milfont, Centre for Applied Cross-Cultural Research, School of Psychology, Victoria University of Wellington, PO Box 600, Wellington, New Zealand.

References

- Beck, U., Boss, W., & Lau, C. (2003). The theory of reflexive modernization: problematic, hypotheses and research programme. *Theory, Culture and Society*, 20, 1-33. doi: 10.1177/0263276403020002001
- Bond, M. H. *et al.* (2004). Culture-level dimensions of social axioms and their correlates across 41 cultures. *Journal of Cross-Cultural Psychology*, 35, 548-570. doi: 10.1177/0022022104268388
- Daly, M. C., Wilson, D. J., & Johnson, N.J. (2012). *Relative status and well-being: Evidence from U.S. suicide deaths*. Retrieved from: <http://www.frbsf.org/publications/economics/papers/2012/wp12-16bk.pdf>
- Durkheim, E. (1897). *Suicide: a study in sociology*. London, UK: Routledge and Kegan Paul.
- Eckersley, R. & Dear, K. (2002). Cultural correlates of youth suicide. *Social Science & Medicine*, 55, 1891-1904. doi: 10.1016/S0277-9536(01)00319-7
- Gelfand, M. J., Raver, J. L., Nishii, L., Leslie, L. M., Lun, J., Lim, B. C., ..., Yamaguchi, S. (2011). Differences between tight and loose cultures: a 33-nation study. *Science*, 332, 1100-1104. doi: 10.1126/science.1197754
- Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviors, institutions, and organizations across nations* (2nd ed.). Thousand Oaks: Sage Publications.
- House, R. J., Hanges, P. J., Javidan, M., Dorfman, P. W., & Gupta, V. (2004). *Culture, leadership and organizations: The GLOBE study of 62 societies*. Thousand Oaks: Sage Publications.
- Inglehart, R. (2000). Globalization and postmodern values. *Washington Quarterly*, 23, 215-228. doi: 10.1162/016366000560665
- Inglehart, R., & Welzel, C. (2005). *Modernization, cultural change and democracy*. New York: Cambridge University Press.
- Inglehart, R. & Welzel, C. (2012). *National-level value scores on traditional/secular-rational and survival/self-expression values for all available surveys*. Retrieved from http://www.worldvaluessurvey.org/wvs/articles/folder_published/article_base_111
- Kagitcibasi, C. (2005). Autonomy and relatedness in cultural context. *Journal of Cross-Cultural Psychology*, 36, 403-422. doi: 10.1177/0022022105275959
- Lenzi, M., Colucci, E., & Minas, H. (2011). Suicide, culture, and society from a cross-national perspective. *Cross-Cultural Research*, 46, 50-71. doi: 10.1177/1069397111424036
- Lester, D. (2003). Nations' rated individualism and suicide and homicide rates. *Psychological Reports*, 92, 426. doi: 10.2466/pr0.2003.92.2.426
- Leung, K., Bond, M. H., De Carrasquel, S. R., Munoz, C., Hernandez, M., Murakami, F., . . . Singelis, T. M. (2002). Social axioms: The search for universal dimensions of general beliefs about how the world functions. *Journal of Cross-Cultural Psychology*, 33, 286-302. doi: 10.1177/0022022102033003005
- Matsumoto, D. Yoo, S. H. (2006). Toward a new generation of cross cultural research. *Perspectives on Psychological Science*, 1, 234-250. doi: <http://dx.doi.org/10.1111/j.1745-6916.2006.00014.x>
- McAdams, D. P., & Pals, J. L. (2006). A new Big Five: Fundamental principles for an integrative science of personality. *American Psychologist*, 61, 204-217. doi: 10.1037/0003-066X.61.3.204
- McCrae, R. R. (2004). Human nature and culture: A trait perspective. *Journal of Research in Personality*, 38, 3-14. doi: 10.1016/j.jrp.2003.09.009
- McCrae, R. R., Terracciano, & 79 Members of the Personality Profiles of Cultures Project. (2005). Personality profiles of cultures: Aggregate personality traits. *Journal of Personality and Social Psychology*, 89, 407-425. doi: 10.1037/0022-3514.89.3.407
- McGregor, I., & Little, B. R. (1998). Personal projects, happiness, and meaning: On doing well and being yourself. *Journal of personality and social psychology*, 74, 494-512. doi: 10.1037/0022-3514.74.2.494
- Niederle, M. & Vesterlund, L. (2007). Do women shy away from competition? Do men compete too much? *The Quarterly Journal of Economics*, 122, 1067-1101. doi: 10.1162/qjec.122.3.1067
- Preacher, K. J. (2002). Calculation for the test of the difference between two independent correlation coefficients: Preacher, K. J. Retrieved from <http://quantpsy.org>
- Rudmin, F. W., Ferrada-Noli, M., & Skolbekken, J.-A. (2003). Questions of culture, age and gender in the

- epidemiology of suicide. *Scandinavian Journal of Psychology*, 44, 373-381. doi: 10.1111/1467-9450.00357
- Runciman, W. G. (1966). *Relative deprivation and social justice*. London, UK: Routledge and Kegan Paul.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55, 68-78. doi:10.1037/0003-066x.55.1.68
- Schmitt, D. P., Allik, J., McCrae, R. R., & Benet-Martinez, V. (2007). The geographic distribution of big five personality traits: Patterns and profiles of human self-description across 56 nations. *Journal of Cross-Cultural Psychology*, 38, 173-212. doi: 10.1177/0022022106297299
- Schwartz, B. (2004). *The paradox of choice - why more is less*. New York, N.Y.: Harper Perennial.
- Schwartz, S. H. (1994). Beyond individualism/collectivism: New cultural dimensions of values. In U. Kim, H. C. Triandis, C. Kagitcibasi, S. Choi, & G. Yoon (Eds.), *Individualism and collectivism: Theory, method, and applications* (pp. 85-119). Thousand Oaks: Sage Publications.
- Smith, P. B., Dugan, S., & Trompenaars, F. (1996). National culture and the values of organizational employees: A dimensional analysis across 43 nations. *Journal of Cross-Cultural Psychology*, 27, 231-264. doi: 10.1177/0022022196272006
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed). Boston: Pearson/Allyn & Bacon.
- The World Bank (2013). GDP per capita (current US \$). Retrieved from <http://data.worldbank.org/indicator/NY.GDP.PCAP.CD?page=3>
- World Health Organization (2012). *Suicide prevention. Country reports and charts*. Retrieved from http://www.who.int/mental_health/prevention/suicide/country_reports/en/index.html
- World Health Organization (2014). *Suicide data*. Retrieved from http://www.who.int/mental_health/prevention/suicide/suicideprevent/en/
- Zhang, J. (1998). Suicide in the world: Toward a population increase theory of suicide. *Death Studies*, 22, 525-539. doi: 10.1080/074811898201380